

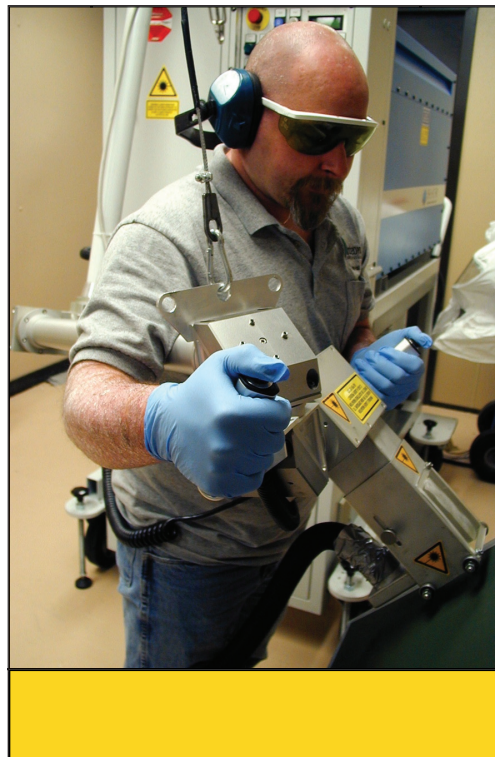


Air Force Research Laboratory|AFRL

Science and Technology for Tomorrow's Air and Space Force

Success Story

TEAM DEMONSTRATES AND VALIDATES COMMERCIAL, PORTABLE HANDHELD LASERS FOR PAINT STRIPPING AND COATING REMOVAL



Using pulsed lasers for paint and coating removal during inspection, maintenance, and nondestructive evaluation work offers the Air Force a non-abrasive process that eliminates the need for potentially hazardous chemicals that create liquid waste. This process also offers increased safety and time advantages over current coating removal processes.

Laboratory experts expect that successful demonstration and evaluation of the lasers will lead to application of laser stripping processes for use by technicians at Department of Defense maintenance depots and Air Force Air Logistics Centers. The process will supplement existing depainting processes in an effective, environmentally safe manner.



Air Force Research Laboratory
Wright-Patterson AFB OH

Accomplishment

A team from the Materials and Manufacturing Directorate and the Air Force Materiel Command (AFMC) demonstrated and validated commercially available, portable handheld lasers for coating removal. The technology demonstration and validation program, part of the Joint Group on Pollution Prevention process, is a partnership between various government organizations to validate and implement cleaner and cheaper processes at military and industrial facilities.

Background

Commercial and military aircraft frequently need paint stripped to allow for inspection, maintenance, and nondestructive evaluation work. Off-the-shelf, pulsed laser systems offer significant benefits as a non-abrasive coating removal process.

Pulsed lasers work by emitting a series of brief energy bursts while aimed at the surface of a coated material. These lasers remove coatings applied to the material by applying energy. On aircraft materials, technicians can use the laser to remove multi-layered paints, primers, or other special coatings. Aircraft workers repeat this process until reaching the desired depth and tailor the system to strip at a specific depth to remove single layers of coating or paint while others remain intact.

Directorate engineers began the prototype for this project in 1998, based on requirements of the Environmental Safety and Occupational Health Technology Integrated Product Team, now the Environmental Development Planning Team. In 2000, the directorate's Pollution Prevention Research and Development Team and AFMC's Logistics Environmental Branch teamed to identify the prototype technology and begin the demonstration, validation, and technology transition process based on a Joint Test Protocol (JTP). The JTP is a set of requirements used to qualify available commercial off-the-shelf systems to meet joint service and National Aeronautics and Space Administration needs.

Technicians from the directorate's Survivability and Sensor Materials Division's Laser Hardened Materials Evaluation Laboratory began demonstrating the capabilities of two neodymium yttrium alumina garnet laser-cleaning machines. These machines are capable of producing 120 watts (W) of average power. They contain a diode laser with power capabilities reaching to 250 kilowatts of average power and a carbon dioxide laser with an average power of 520 W.

Additional information

To receive more information about this or other activities in the Air Force Research Laboratory, contact TECH CONNECT, AFRL/XPTC, (800) 203-6451 and you will be directed to the appropriate laboratory expert. (02-ML-22)